

## REMARKS

Pending claims 1-33 have been rejected as obvious over various combinations, where the Office Action relied primarily on U.S. Patent Application Publication 2004/0100770 to Chu *et al.* ("*Chu '770*") as showing a rack of computing equipment having a plurality of spaces with a heat exchanger for each space and fan for each space, and U.S. Patent Application Publication 2003/0053293 to Beitelmal *et al.* ("*Beitelmal*"), as disclosing a fan controller corresponding to each fan and configured to variably control a speed of the corresponding fan according to at least a temperature in a corresponding space and a temperature of at least one component. All of the previously pending claims have been deleted, and have been replaced with new claims 34-54, of which claims 34, 43, and 48 are independent.

### **The Relied Upon References Fail to Teach or Suggest Each Element of New Claim 34**

New claim 34, for example, recites a system for cooling electronic components that comprises an open-sided rack structure holding a plurality of computer boards, a plurality of air circulation fans, one or more cooling coils, and a fan controller corresponding to each air circulation fan. The fans are located near one of the sides of the rack structure and an edge of the computer boards, and are positioned to circulate cooling air across an associated board, and provide substantially all air flow over the boards. The fan controller corresponding to each air circulation fan controls the speed of the corresponding fan according to a temperature sensed around a board corresponding to the air circulation fan.

*Chu '770* lacks multiple features from claim 34. For example, the cabinet shown in *Chu '770* is closed on both sides, and in fact, the *Chu '770* system depends on having a closed cabinet so that the various fans shown in the reference can circulate air from one side of the rack to the other. Thus, the *Chu '770* system does not have open first and second opposed sides, as recited in claim 34. In addition, *Chu '770* does not disclose a fan controller as recited in any of the new claims.

*Beitelmal* does not make up for the deficiencies in the *Chu '770*. The *Beitelmal* system is a computer rack that provides very localized, supplemental cooling by placing cooling tubes near certain computer components. The supplemental cooling is provided by blowers at the top of the

rack, via plena running down the sides of the rack. *Beitelmal* thus does not provide substantially all the air flow over a board using fans near one of the open sides of a rack structure. *Beitelmal* also does not have a fan controller corresponding to each air circulation fan so arranged, to control the speed of its corresponding fan. Rather, the blowers in the *Beitelmal* system, to the extent the Office considers them to correspond to the fans of the pending claims, appear to be controlled merely to maintain a constant or sufficient pressure in the plena so that the localized cooling nozzles will have an adequate air supply. Also, the blowers are, in any event, not located near one of the opposed open sides of the rack structure, nor are they near a cooling coil located near one of the open opposed sides of the rack structure. There would also be no reason to combine the disclosures of *Chu* '770 and *Beitelmal*. The *Chu* '770 system includes fans for providing cooling to each level in a rack, and thus there would appear to be no need for the spot cooling as taught by *Beitelmal* to be added to *Chu* '770.

Accordingly, Applicant respectfully requests allowance of new claim 34, as well as new independent claims 43 and 48, which contain certain features analogous to those in claim 34. Additionally, Applicant respectfully requests allowance of all claims depending from claims 34, 43, and 48.

#### **The Relied Upon References Fail to Teach or Suggest Each Element of New Claim 36**

New claim 36, which depends from claim 34, is patentable for reasons independent of and in addition to the reasons just discussed. Claim 36 recites a plurality of rack structures. Each rack structure has associated air fans, cooling coils, and fan controllers. The rack structures are arranged to form a pair of rows on each side of a central aisle, with the cooling coils located on sides of the rack structures away from the aisle and near outside walls of a container that houses the plurality of rack structures. As with claim 34, above, *Chu* '770 lacks multiple features of dependent claim 36. For example, *Chu* '770 does not disclose or suggest providing such a central aisle in its cabinet. Indeed, *Chu* '770 expressly teaches away from such an extra space such as a central aisle by emphasizing the importance of minimizing the size of the cabinet to decrease the total footprint. Moreover, *Beitelmal* fails to account for at least this deficiency in *Chu* '770 regarding dependent claim 36. *Beitelmal*'s rack system does not include such a central aisle where rack structures are arranged on each side, but rather, it discusses a single column of

trays including electronic subsystems (*e.g.*, servers) and their components. In sum, neither of the primary references relied on by the Office Action discloses each and every feature of dependent claim 36 in addition to independent claim 34.

**The Relied Upon References Fail to Teach or Suggest Each Element of New Claim 40**

As another example, new claim 40, which depends from claim 34, also includes additional features undisclosed by *Chu* '770 and *Beitelmal*. Claim 40 recites a valve in fluid communication with the cooling coil for modulating a cooling liquid to the cooling coil and a valve controller operated by a common control system as the fan controller. The valve is controlled by the valve controller according to at least one of a temperature and a pressure of the cooling liquid. *Chu* '770 lacks multiple features of dependent claim 40. For example, *Chu* '770 does not disclose or suggest a valve in fluid communication with the cooling coil for modulating a cooling liquid to the cooling coil. To the extent *Chu* '770 discloses any valve in fluid communication with a heat exchange device, it merely discloses providing shut-off type valves on supply and return lines to a heat exchanger to be closed in the event of a leak of chilled water to the heat exchanger. Thus *Chu* '770 does not disclose either (1) using a valve to modulate a cooling liquid to any heat exchange device, including a cooling coil, and (2) controlling the valve according to at least one of a temperature and a pressure of the cooling liquid.

*Beitelmal*, again, fails to account for at least this deficiency in *Chu* '770. *Beitelmal* fails to disclose any cooling liquid, to say nothing of a valve in fluid communication with the cooling coil for modulating a cooling liquid to the cooling coil. Rather, *Beitelmal* teaches using supplemental cooling of a computer rack by placing cooling tubes near certain computer components to carry a cooling gas to the components from one or more blowers. As such, neither of the primary references relied upon by the Office Action discloses or suggests each and every element of new dependent claim 40.

### CONCLUSION

Applicant has now made an earnest attempt to place this case in condition for allowance. For the foregoing reasons, and for other reasons clearly apparent, Applicant respectfully requests full allowance of all new claims.

Any circumstance in which the Applicant has (a) addressed certain comments of the examiner does not mean that the Applicant concedes other comments of the examiner, (b) made arguments for the patentability of some claims does not mean that there are not other good reasons for patentability of those claims and other claims, or (c) amended or canceled a claim does not mean that the Applicant concedes any of the examiner's positions with respect to that claim or other claims.

The fees in the amount of \$930 for the Request for Continued Examination and Petition for Extension of Time fee for one (1) month is being paid concurrently herewith on the Electronic Filing System (EFS) by way of Deposit Account authorization to Deposit Account No. 06-1050. Please apply any other charges or credits to Deposit Account No. 06-1050, referencing the attorney docket number shown above.

Respectfully submitted,

Date: \_\_\_\_\_

7/16/08

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